

KIPSONLINEEARLYPREPSESSION

BY SAEED MDCAT

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SPECIAL THANKS TO DR.ASMA
REGARD.HUZAIFA SAEED,USAMA SOHAIL



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Regards.Huzaifa Saeed,Usama Sohail

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190+ 35 Students

185+ 218 Students

180+ 677 Students



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QUIZZES

Practice Test Unit 1



10 Questions



7 min

Topics

Displacement, Velocity

Start Quiz

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06 : 52



1/10



7 min



Hint

Q :

A person moves along a circular track and covers half of the path as shown in figure. What will be the ratio of its distance to displacement covered?



A

 $2r$

B

 $4r$

C

 $\frac{r}{2}$

D

 $\frac{\pi}{2}$

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06 : 45



2/10



7 min



Hint

Q :

An athlete completes one round of a circular track of radius R in 40 sec. What will be his displacement at the end of 3 min. 20 sec?

Zero

A

B

$2\pi R$

C

$2R$

D

$7\pi R$

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1

2

3

4

5

6

7

06 : 43



3/10



7 min



Hint

Q :

A man leaves his house for a cycle ride. He comes back to his house after half-an-hour after covering a distance of one km. What is his average velocity for the ride?

A

zero

B

2 km/h

C

10 km/h

D

$1/2$ km/h

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1

2

3

4

5

6

7

06 : 41



4/10



7 min



Hint

Q :

Stopping distance of a moving vehicle is directly proportional to

A

square of the initial velocity

B

square of the initial acceleration

C

the initial velocity

D

the initial acceleration

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1

2

3

4

5

6

7

06 : 39



5/10



7 min



Hint

Q :

The ratio of displacement along diameter and total distance along circle:



1 : π



2 : π



π : 1



π : 2

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1

2

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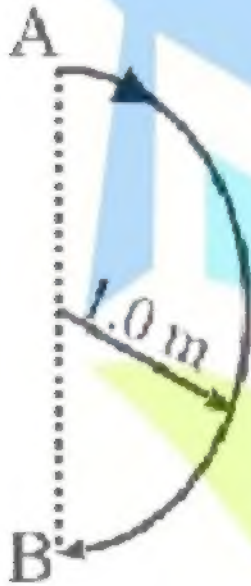
7

06 : 35



Q :

In 1.0 second a particle goes from point A to point B moving in a semi-circle a radius 1.0 m (figure). The magnitude of the average velocity is



A

3-14 m/s

B

2.0 m/s

C

1/0 m/s

zero

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1

2

3

4

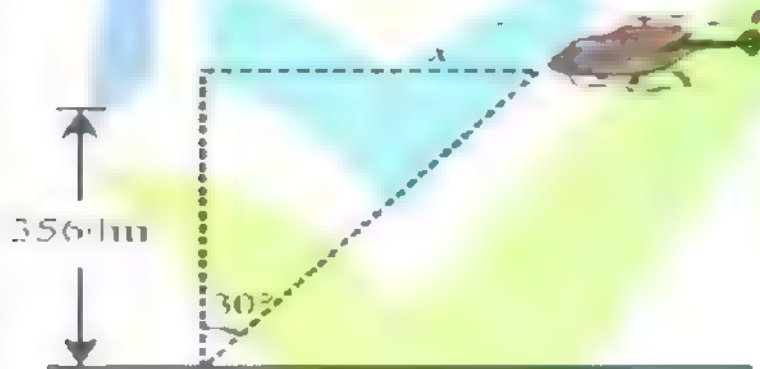
5

6

7

Q:

A helicopter is flying at 3564 m above ground. If an angle of 30° is subtended at a ground point by the helicopter position 100s apart, what is the speed of the helicopter



100 ms⁻¹

150 ms⁻¹

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20 ms⁻¹

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25 ms⁻¹

Q:

A car travels equal distance in the same direction with velocities 60 km h^{-1} , 20 km h^{-1} and 10 km h^{-1} respectively. The average velocity of the car over the whole journey of motion is

☐ 8 ms^{-1}

☐ 6 ms^{-1}

☐ 7 ms^{-1}

☒ 5 ms^{-1}

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Q:

Two bodies are moving in opposite directions with velocity v . The relative velocity of one with respect to the other is

☐ $\sqrt{2}v$

☐ $2v$

☐ v

☐ Zero

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Q:

Two bodies are moving in opposite directions with velocity v . The relative velocity of one with respect to the other is

☐ $\sqrt{2}v$

☐ $2v$

☐ v

☐ Zero

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Q:

A moves with 65 km/h while B is coming back of A with 80 km/h. The relative velocity of B with respect to A is

80 km/h

60 km/h

15 km/h

145 km/h

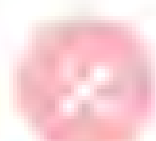
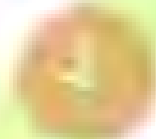
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QUIZ RESULT

Practice Test Unit 1



0/10

0.0%

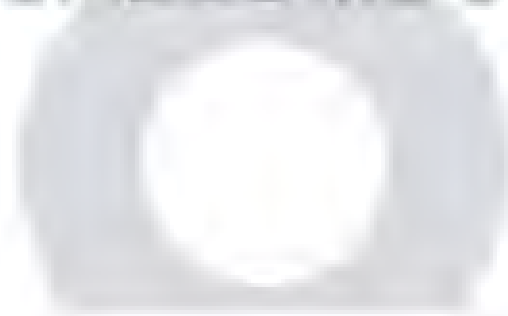
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Result Detail

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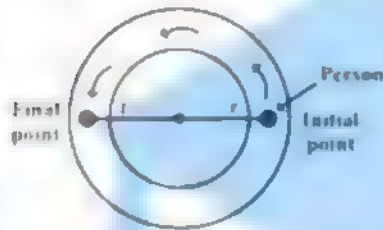


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← Practice Test Unit 1

A person moves along a circular track and covers half of the path as shown in figure. What will be the ratio of its distance to displacement covered?



☐ $2r$

☐ $4r$

☐ $\frac{r}{2}$

☒ $\frac{\pi}{2}$

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Explanation

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$$\frac{S}{d} = \frac{r\theta}{2r} = \frac{\pi}{2}$$

← Practice Test Unit 1

Q:

An athlete completes one round of a circular track of radius R in 40 sec. What will be his displacement at the end of 3 min. 20 sec?

☒ Zero

☐ $2\pi R$

☐ $2R$

☐ $7\pi R$

Explanation

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Total time of motion is 3 min 20 sec = 200 sec. As time period of circular motion is 40 sec so in 200 sec athlete will complete 5 revolution i.e., he will be at starting point i.e., displacement = zero.

← Practice Test Unit 1



Unattempted



3/10

Q:

A man leaves his house for a cycle ride. He comes back to his house after half-an-hour after covering a distance of one km. What is his average velocity for the ride?



zero



2 km/h



10 km/h



$\frac{1}{2}$ km/h

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Explanation



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Since displacement is zero.

← Practice Test Unit 1

Q :

Stopping distance of a moving vehicle is directly proportional to

- ☒ square of the initial velocity
- ☐ square of the initial acceleration
- ☐ the initial velocity
- ☐ the initial acceleration

Explanation

Let s be the distance travelled by the vehicle before it stops. Final velocity

$v=0$

, initial velocity = u Using equation of motion

$$v^2 - u^2 = 2aS$$

$$0^2 - u^2 = 2aS$$

Stopping distance,

$$S = -u^2/2a$$

Q:

The ratio of displacement along diameter and total distance along circle:



1 : π



2 : π



π : 1



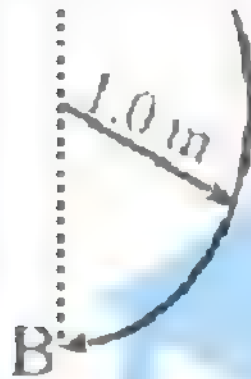
π : 2

Explanation

$$|\vec{d}| = 2r \text{ (along diameter)}$$

$$S = 2\pi r \text{ (distance along circle)}$$

$$\frac{|\vec{d}|}{S} = \frac{2r}{2\pi r} = 1 : \pi$$



3.14 m/s



2.0 m/s



1/0 m/s



zero

Explanation

$$v = u + at = 2(1) = 2$$

$$v_{avg} = \frac{\Delta d}{\Delta t} = \frac{2}{1} = 2 \text{ ms}^{-1}$$

← Practice Test Unit 1



100 ms⁻¹

150 ms⁻¹

20 ms⁻¹

25 ms⁻¹

Explanation

Here $\tan 30^\circ = x/3564$

$$x = 3564 \times \frac{1}{\sqrt{3}} = 2000 \text{ m}$$

$$\text{Speed of the helicopter} = \frac{2000}{100} = 20 \text{ ms}^{-1}$$

← Practice Test Unit 1

Q :

A car travels equal distance in the same direction with velocities 60 km h^{-1} , 20 km h^{-1} and 10 km h^{-1} respectively. The average velocity of the car over the whole journey of motion is

☐ 8 ms^{-1}

☐ 6 ms^{-1}

☐ 7 ms^{-1}

☒ 5 ms^{-1}

Explanation

Average velocity

$$= \frac{\frac{x}{60} + \frac{x}{20} + \frac{x}{10}}{\frac{x}{60} + \frac{x}{20} + \frac{x}{10}} = \frac{\frac{3x}{10}}{\frac{3x}{10}} = \frac{3x \times 60}{10x} = 18$$

← Practice Test Unit 1

Q :

A car travels equal distance in the same direction with velocities 60 km h^{-1} , 20 km h^{-1} and 10 km h^{-1} respectively. The average velocity of the car over the whole journey of motion is

☐ A 8 ms^{-1}

☐ B 6 ms^{-1}

☐ C 7 ms^{-1}

☒ D 5 ms^{-1}

Explanation

$$= \frac{3x}{\frac{x}{60} + \frac{x}{20} + \frac{x}{10}} = \frac{3x \times 60}{10x} = 18 \text{ km h}^{-1} = 5 \text{ ms}^{-1}$$

← Practice Test Unit 1

4.

Two bodies are moving in opposite directions with velocity v . The relative velocity of one with respect to the other is

☐ $\sqrt{2}v$

☒ $2v$

☐ v

☐ Zero

Explanation

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$$v_{rel} = \sqrt{v_1^2 + v_2^2 - 2v_1v_2\cos\theta}$$

$$v_{rel} = \sqrt{v^2 + v^2 - 2v^2\cos 180^\circ}$$

$$V_{rel} = \sqrt{v^2 + v^2 - 2v^2} = \sqrt{4v^2} = 2v$$

← Practice Test Unit 1

Q :

A moves with 65 km/h while B is coming back of A with 80 km/h. The relative velocity of B with respect to A is

80 km/h

60 km/h

15 km/h

145 km/h

Explanation

$$v_B + v_A = v_B + v_A = 80 + 65 = 145 \text{ km/hr}$$

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QUIZZES

Practice test 2 unit 1



Questions



Time

00:00

RIGHT! 100%

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Q:

A constant force F changes the velocity of a 80kg sprinter from 3ms^{-1} to 4ms^{-1} in 0.5 sec. The acceleration of sprinter will be

☐ 1.5 ms^{-2}

☐ 2.5 ms^{-2}

☐ 2.0 ms^{-2}

☐ 3.0 ms^{-2}

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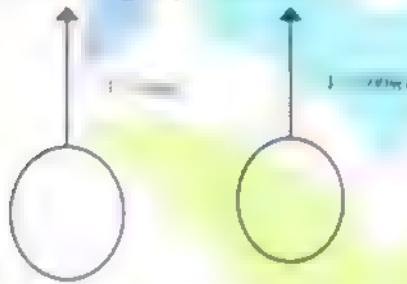
2/10

10 min



10 min

Q : A ball is projected upwards with an initial velocity $V_i = 100 \text{ ms}^{-1}$ as shown in the figure. It comes back after sometime and strikes ground with the same velocity but pointing downward. What is the angle between acceleration when moving upward to acceleration coming down?



180°



90°

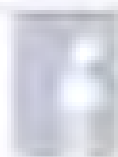


60°



0°

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Q:

A baseball is thrown vertically into the air. The acceleration of the ball at its highest point is:

- ☐ Zero
- ☐ g , up
- ☐ g , down
- ☐ $2g$, down

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4/10

10 min



10 min

Q:

A passenger in a moving train tosses a coin. If the coin falls behind him, the train must be moving with



An acceleration



a deceleration



A uniform speed



any of the above

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2/10

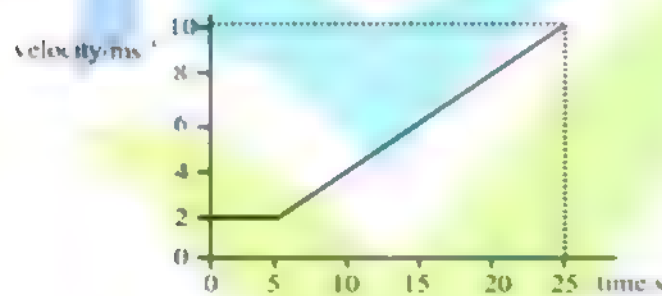
10 min



10 min

Q:

The diagram shows a velocity-time graph for a particle moving along a straight line. What is the displacement of the particle between 0 s and 25 s?



90 m



130 m



120



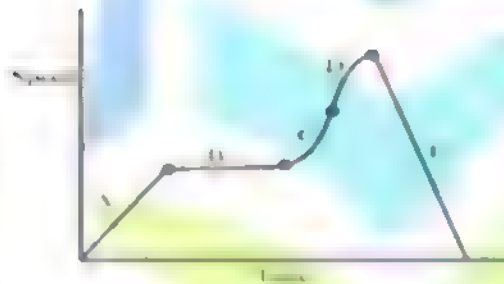
150 m



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Q : The graph shows how the speed of an object changes with time. Which section of the graph shows the object moving with an increasing acceleration?



☐ A

☐ B

☒ C

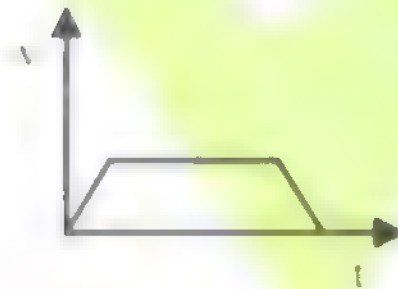
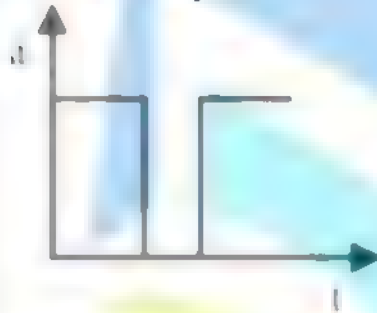
☐ D

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Q : Acceleration-time graph of a body is shown.
The Corresponding velocity time graph of the
same body is



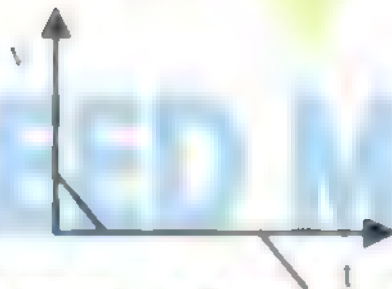
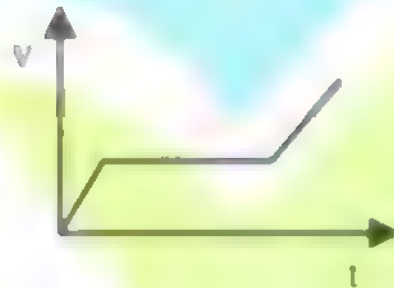
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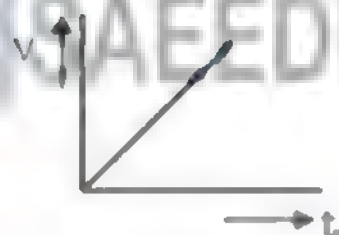
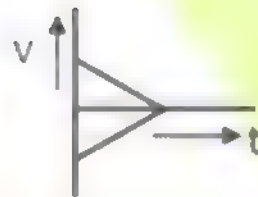
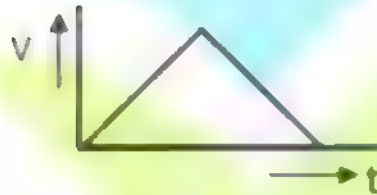


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Q : Displacement time graph of a ball thrown vertically upward is shown in figure then its v-t graph is:

Displacement





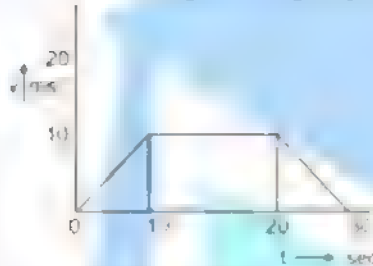
9/10

10 min



Hint

Q : In the given graph distance traveled is:



200m



300 m



250 m



400m

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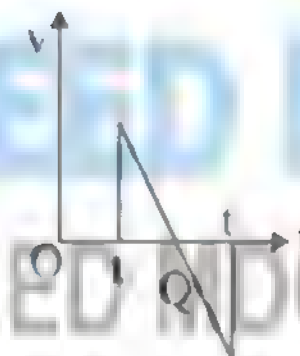
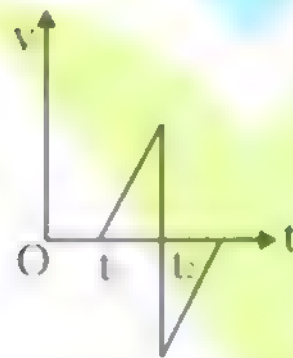
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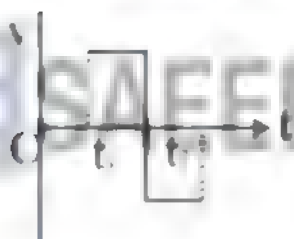
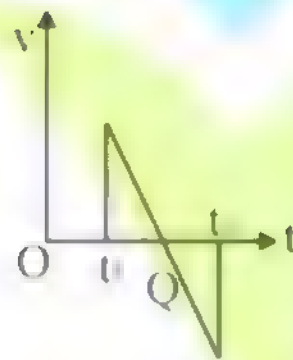
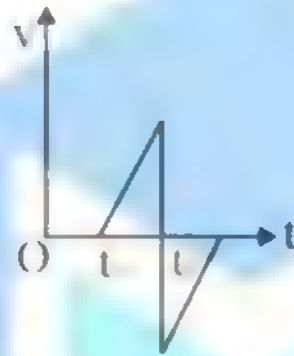
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Q : A batsman hits a sixer and the ball reaches out of the cricket ground. Which of the following graphs describes the variation of the cricket ball's vertical velocity v with time between t_1 (the time of hitting the bat and time t_2 (the time of touching the ground)?



t_2 (the time of touching the ground)?



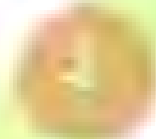


QUIZ RESULT

Practice test 2 unit 1



Q



Q



15/10/2021



15/10/2021



0/10



0.0%

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Result Detail

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← Practice test 2 unit 1



Correct



Unattempted



Incorrect



1/10

Q:

A constant force F changes the velocity of a 80kg sprinter from 3ms^{-1} to 4ms^{-1} in 0.5 sec. The acceleration of sprinter will be



1.5 ms^{-2}



2.5 ms^{-2}



2.0 ms^{-2}



3.0 ms^{-2}

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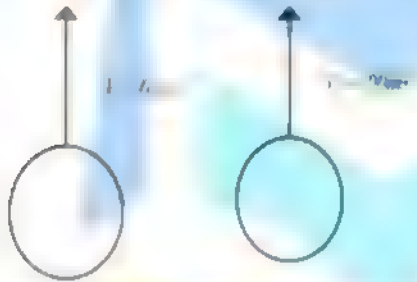
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Explanation

$$a = \frac{v_f - v_i}{t} = \frac{4 - 3}{0.5} = 2\text{ms}^{-2}$$

← Practice test 2 unit 1

Q : A ball is projected upwards with an initial velocity $V = 100 \text{ ms}^{-1}$ as shown in the figure. It comes back after sometime and strikes ground with the same velocity but pointing downward. What is the angle between acceleration when moving upward to acceleration coming down?



☐ 180°

☐ 90°

☐ 60°

☒ 0°

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Explanation

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Direction of acceleration due to gravity toward earth center.

← Practice test 2 unit 1



Correct



Unattempted



Incorrect



3 / 10

Q :

A baseball is thrown vertically into the air. The acceleration of the ball at its highest point is:



Zero



g , up



g , down



$2g$, down

Explanation

The acceleration of ball at highest point when thrown vertically upward option (c) g , down.

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Correct



Wrong



Wrong



4/10

Q:

A passenger in a moving train tosses a coin. If the coin falls behind him, the train must be moving with



An acceleration



a deceleration



A uniform speed



any of the above

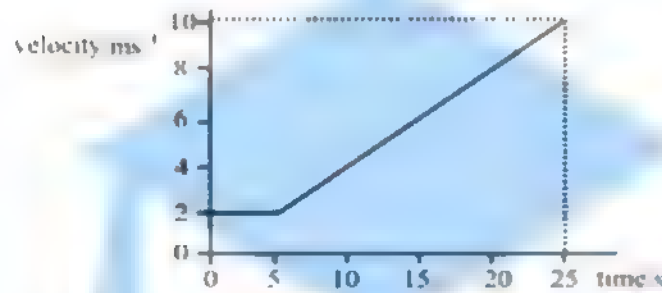
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← Practice test 2 unit 1

the displacement of the particle between 0 s and 25 s?



☐ A 90 m

☒ B 130 m

☐ C 120

☐ D 150 m

Explanation

Explanation Displacement = area under graph

$$= (2 \times 5) + \frac{1}{2}(25 - 5)(2 + 10)$$

$$= 130 \text{ m}$$

← Practice test 2 unit 1



Correct



Unattempted

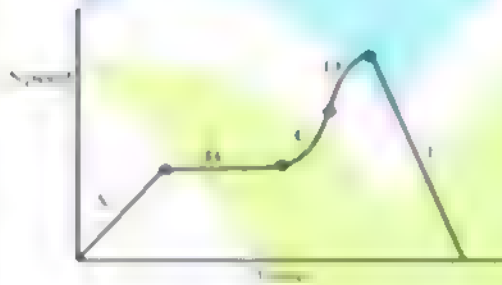


Correct



6/10

Q : The graph shows how the speed of an object changes with time. Which section of the graph shows the object moving with an increasing acceleration?



A



B



C



D

← Practice test 2 unit 1



Correct



Unattempted

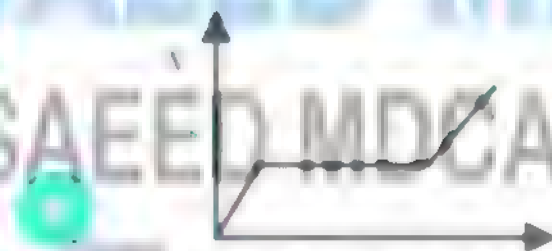
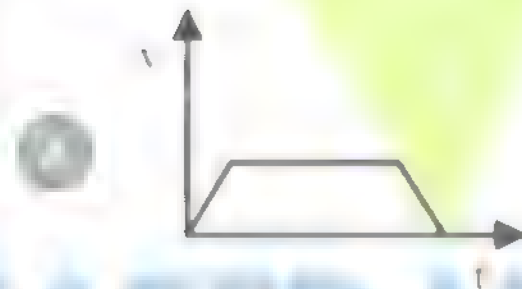
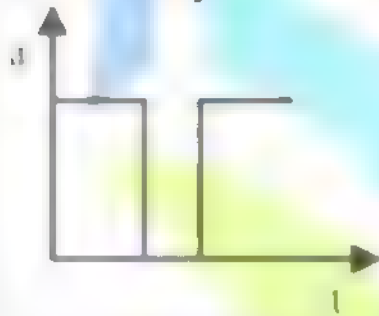


Correct



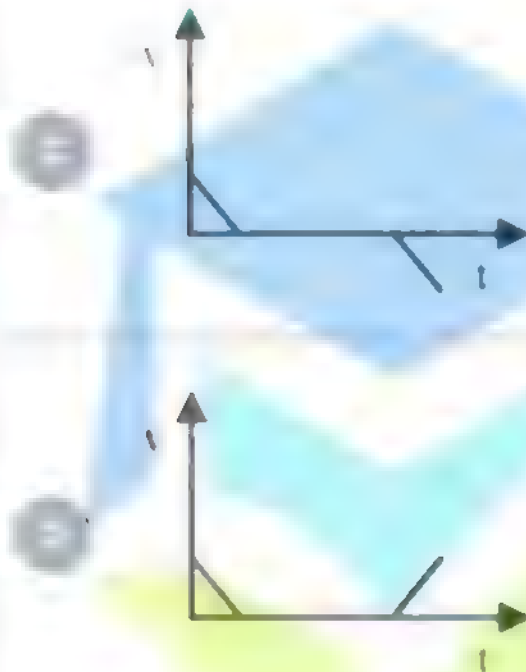
7/11

Q : Acceleration-time graph of a body is shown.
The Corresponding velocity time graph of the
same body is



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← Practice test 2 unit 1

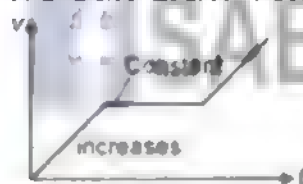


Explanation

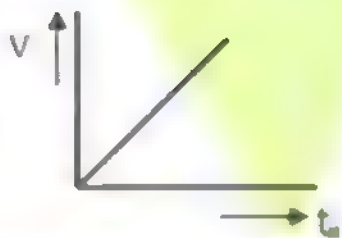
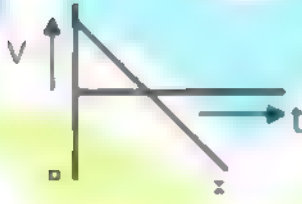
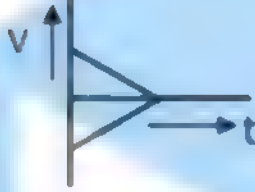
Rate of change of velocity is acceleration.

We know that $a = \frac{\Delta v}{\Delta t}$ where a is acceleration and v is velocity. In the given graph acceleration is constant for first part of motion. So, velocity increases uniformly.

When $a=0$ i.e, $0 = \frac{\Delta v}{\Delta t} \Rightarrow v = \text{constant}$ Thus, we can draw velocity time graph as:



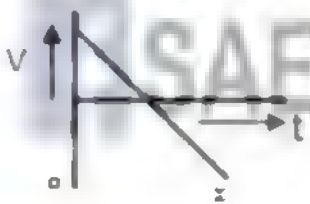
4. Acceleration (m/s²)



Explanation

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Explanation It v-t graph is:



← Practice test 2 unit 1



Correct



Unattempted

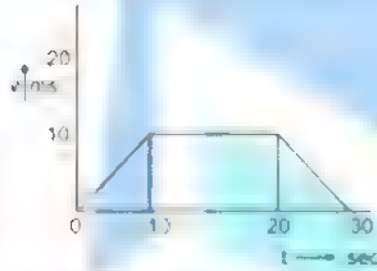


Incorrect



0/0

Q : In the given graph distance traveled is:



200m



300 m



250 m



400m

Explanation

S=Area under the graph, S= Area of

trapezium, $S = \frac{1}{2} (30 + 10)(10) = 200m$

← Practice test 2 unit 1



Correct



Unattempted

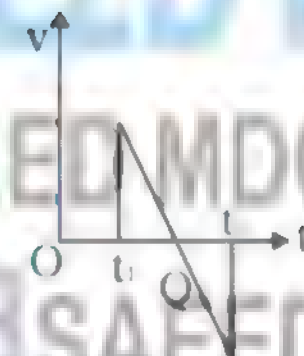
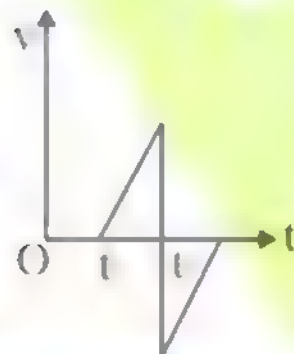


Incorrect

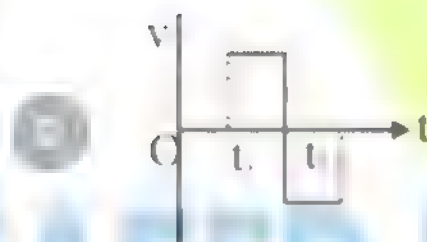
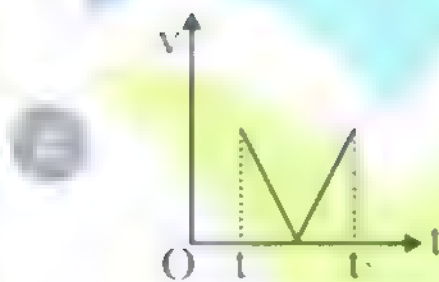
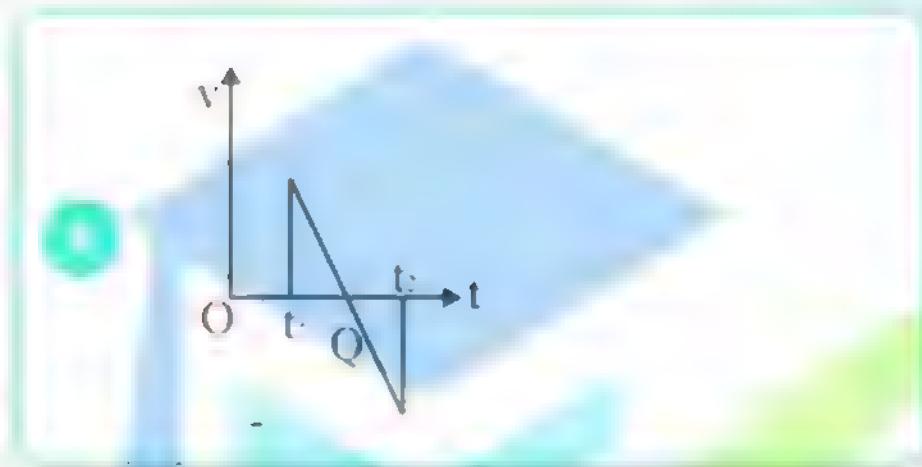


Attempted

Q : A batsman hits a sixer and the ball reaches out of the cricket ground. Which of the following graphs describes the variation of the cricket ball's vertical velocity v with time between t_1 (the time of hitting the bat and time t_2 (the time of touching the ground)?



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Explanation

Initially the ball has vertical component of motion upward. It decreases, becomes zero and then begins to increase in downward direction.

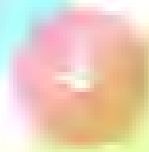
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QUIZZES

Practice test 3 unit 1



2 min

7 min

Topic

Start Quiz

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Q:

The engine of a car produces an acceleration of 6 ms^{-2} in the car. If this car pulls another car of the same mass, then the acceleration would be



6 ms^{-2}



12 ms^{-2}



3 ms^{-2}



1.5 ms^{-2}

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2/10

Time



10:00

Q:

What is the resultant force shown in fig?



7 N towards



17 N in arbitrary direction



3 N toward left



10 N towards left

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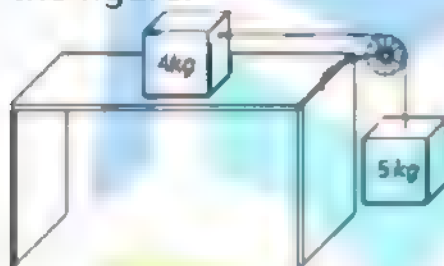
Q 116

Topic



Unit

Q : Two masses of 4 kg and 5 kg are connected by a string passing through a frictionless pulley and are kept on a frictionless table as shown in the figure.



The acceleration of 5 kg mass is



49m/s²



5.44m/s²



19.5m/s²



2.72m/s²

Q : A particle of mass "m" is projected with a velocity $6\hat{i} + 8\hat{j}$. Find the change in momentum when it touches ground:

☐ 16 m

☒ 12 m

☐ 10 m

☐ 20 m

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2/10

Time



Exit

Q:

Two masses of 1 gm and 4 gm are moving with the same kinetic energy. The ratio of their linear momentum will be



1:16



1:2



$\sqrt{2}:1$



4:1

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Q : When the velocity is doubled:

- ☐ A K.E is doubled
- ☐ B Acceleration is doubled
- ☐ C Momentum is doubled
- ☐ D P.E is doubled

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Q:

The momentum is most closely related to

- ☐ Force
- ☐ Impulse
- ☐ Power
- ☐ K.E.

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Q:

A wagon weighing 1000 kg is moving with a velocity 50 km/h on smooth horizontal rails. A mass of 250 kg is dropped into it. The velocity with which it moves now is

☐ 40 km/hour

☐ 50 km/hour

☐ 2.5 km/hour

☐ 20 km/hour

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Q : In which of the following cases forces may not be required to keep the

- ☐ A Particle going in a circle
- ☐ B Particle going along a straight line
- ☐ C The momentum of the particle constant
- ☐ D Acceleration of the particle constant

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Q : The motion of a rocket is based on the principle of conservation of

- ☐ A Mass
- ☐ B Kinetic energy
- ☐ C Linear momentum
- ☐ D Angular momentum

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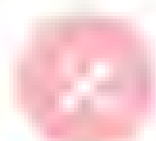
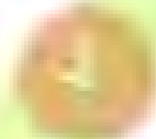
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QUIZ RESULT

Practice test 3 unit 1



0/10

0.0%

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Result Detail

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← Practice test 3 unit 1

Q:

The engine of a car produces an acceleration of 6 ms^{-2} in the car. If this car pulls another car of the same mass, then the acceleration would be

☐ 6 ms^{-2}

☐ 12 ms^{-2}

☒ 3 ms^{-2}

☐ 1.5 ms^{-2}

Explanation

Force applied by engine = 6 ms^{-2}

When two cars are pulled,

$$(m + m)a = 6 \text{ ms}^{-2}$$

$$2ma = 6 \text{ ms}^{-2} \text{ or } a = 3 \text{ ms}^{-2}$$

← Practice test 3 unit 1



Correct



Unattempted



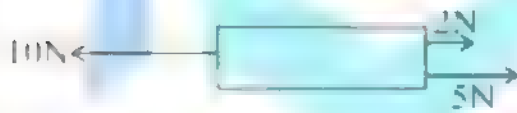
Incorrect



2.

Q:

What is the resultant force shown in fig?



7 N towards



17 N in arbitrary direction



3 N toward left



10 N towards left

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Explanation

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According to 2nd law of motion.

$$F_{net} = 10 + 2 - 5 = 3 \text{ N towards left}$$

← Practice test 3 unit 1

by a string passing through a frictionless pulley and are kept on a frictionless table as shown in the figure.



The acceleration of 5 kg mass is



49m/s²



5.44m/s²



19.5m/s²



2.72m/s²

Explanation

$$a = \frac{m_2}{m_1 + m_2} \times g = \frac{5}{4 + 5} \times 9.8 = \frac{49}{9} = 5.44 \text{ ms}$$

← Practice test 3 unit 1



Correct



Unattempted



Correct



4/10

Q : A particle of mass "m" is projected with a velocity $6\hat{i} + 8\hat{j}$. Find the change in momentum when it touches ground:



16 m



12 m



10 m



20 m

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Explanation
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$$P = mv \quad |\vec{v}| = \sqrt{6^2 + 8^2} = 10$$

$$P = 10m$$

← Practice test 3 unit 1



Correct



Unattempted



Incorrect



5/10

Q:

Two masses of 1 gm and 4 gm are moving with the same kinetic energy. The ratio of their linear momentum will be



1:16



1:2



$\sqrt{2}:1$



4:1

Explanation

$$P = \sqrt{2m K.E} \Rightarrow \frac{P_1}{P_2} = \sqrt{\frac{1}{4} \times \frac{E}{E}} = \frac{1}{2}$$

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Correct



Not Answered



Incorrect



6/10

Q : When the velocity is doubled:



K.E is doubled



Acceleration is doubled



Momentum is doubled



P.E is doubled

Explanation

$$P = mv, P' = m(2v) = 2P$$



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Correct



Wrong



Incorrect



7/11

Q:

The momentum is most closely related to



Force



Impulse



Power



K.E.

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← Practice test 3 unit 1

A wagon weighing 1000 kg is moving with a velocity 50 km/h on smooth horizontal rails. A mass of 250 kg is dropped into it. The velocity with which it moves now is

☒ 40 km/hour

☐ 50 km/hour

☐ 2.5 km/hour

☐ 20 km/hour

Explanation

$$m_1 = 1000 \text{ kg}$$

$$v_1 = 50 \text{ kmph}$$

$$m_2 = 1000 + 250 = 1250 \text{ kg}$$

$$v_2 = ?$$

by principle of conservation of momentum,

$$m_1 v_1 = m_2 v_2$$

$$v_2 = \{(m_1 v_1) / (m_2)\} = \{(1000 \times 50) / (1250)\}$$

$$v_2 = 40 \text{ kmph}$$

← Practice test 3 unit 1



Correct



Unattempted



Correct



9/10

Q : In which of the following cases forces may not be required to keep the



Particle going in a circle



Particle going along a straight line



The momentum of the particle constant



Acceleration of the particle constant

Explanation

If momentum remains constant then force will be zero because

$$F = \frac{\Delta p}{\Delta t}$$



Correct



Maths problem



Incorrect



100%

Q : The motion of a rocket is based on the principle of conservation of



Mass



Kinetic energy



Linear momentum



Angular momentum

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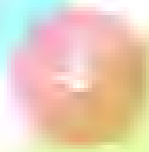
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QUIZZES

Practice test 4 unit 1



20 min



1 hour

100%

RIGHT DAY

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Q :

A billiard ball moving with a speed of 5 m/s collide with an identical ball, originally at rest. If first ball stops dead after the collision, then second ball will move forward with speed of

☐ 10 m/s

☐ 5 m/s

☐ 2.5 m/s

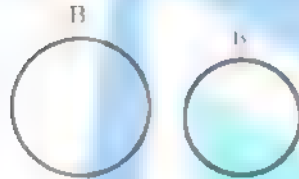
☒ 9 m/s

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Q : When a very heavy ball 'B1' collide with a stationary target 'B2' of negligible mass, after collision the final velocity of ball 'B2' will



- ☐ become zero
- ☐ become half
- ☐ become doubled as compared to B1
- ☒ same as the B1

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Q : A 10 kg object collides with stationary 5 kg object and after collision they stick together and move forward with velocity 4ms^{-1} . What is the velocity with which the 10 kg object hit the second one

☐ 6ms⁻¹

☐ 8ms⁻¹

☐ 12ms⁻¹

☐ 10ms⁻¹

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4/10

7 min



10 min

Q:

When a ball bounces back from floor such that sound and heat is produced then collision



Must be elastic



Must be inelastic



Momentum is conserved but K.E is not conserved



Both B and C

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Q:

A ball of mass 2 kg travelling at 8 ms^{-1} strikes a ball of mass 4 kg travelling at 2 ms^{-1} . Both balls are moving along the same straight line as shown



After collision, both balls move at the same velocity v . What is the magnitude of the velocity v ?

☐ 4 ms^{-1}

☐ 5 ms^{-1}

☐ 6 ms^{-1}

☐ 8 ms^{-1}

Q:

Two similar spheres, each of mass m and travelling with speed v , are moving towards each other.



The spheres have a head on elastic collision. Which statement is correct?

The spheres stick together on impact

The total kinetic energy after impact is mv^2

The total kinetic energy before impact is zero

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Two similar spheres, each of mass m and travelling with speed v , are moving towards each other.



The spheres have a head on elastic collision. Which statement is correct?

☐ The spheres stick together on impact

☐ The total kinetic energy after impact is mv^2

☐ The total kinetic energy before impact is zero

☐ The total momentum before impact is $2mv$

Q:

Two railway trucks of masses m and $3m$ move towards each other in opposite directions with speeds $2v$ and v respectively. These trucks collide and stick together.

What is the speed of the trucks after the collision?

☐ $\frac{v}{4}$

☐ $\frac{v}{2}$

☐ v

☐ $\frac{5v}{4}$

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Q :

Which one of the following is true in the case of inelastic collision?

☐ Total energy Kinetic
Energy Momentum
Conserved Conserved
Conserved

☐ Total energy Kinetic
Energy Momentum
Conserved Not
conserved Conserved

☐ Total energy Kinetic
Energy Momentum
Conserved Not conserved
Conserved

☐ Total energy Kinetic
Energy Momentum
Not conserved Not
conserved Conserved

Q :

A ball is dropped from a height of 10 m. It is embedded 1 m in sand and stops. In this process

- ☐ only momentum is conserved
- ☐ only kinetic energy is conserved
- ☐ both momentum and kinetic energy are conserved
- ☒ neither momentum nor kinetic energy is conserved

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Q118

Topic



Time

Q:

When two bodies collide elastically then the quantity conserved is



Kinetic energy



Momentum



Both



None

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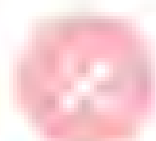
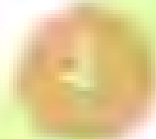
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QUIZ RESULT

Practice test 4 unit 1



0/10

0.0%

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Result Detail

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← Practice test 4 unit 1



Correct



Unattempted



1/10

Q :

A billiard ball moving with a speed of 5 m/s collide with an identical ball, originally at rest. If first ball stops dead after the collision, then second ball will move forward with speed of



10 m/s



5 m/s



2.5 m/s



9 m/s

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Explanation

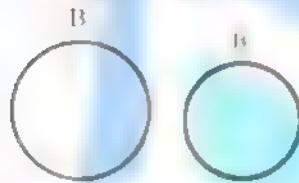


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When two identical balls collide elastically their velocities are interchange.

← Practice test 4 unit 1

Q : When a very heavy ball 'B1' collide with a stationary target 'B2' of negligible mass, after collision the final velocity of ball 'B2' will



☐ become zero

☐ become half

☒ become doubled as compared to B1

☐ same as the B1

Explanation

$$m_1 \gg m_2, v_2 = 0$$

$$v_1 = v, v_2 = 2v$$

← Practice test 4 unit 1



Incorrect



3/10

Q : A 10 kg object collides with stationary 5 kg object and after collision they stick together and move forward with velocity 4ms^{-1} . What is the velocity with which the 10 kg object hit the second one



6ms^{-1}



8ms^{-1}



12ms^{-1}



10ms^{-1}

Explanation

$$m_1 v_1 = (m_1 + m_2) v_c$$

$$v_1 = \left(\frac{m_1 + m_2}{m_1} \right) v_c$$

$$= \frac{15}{10} \times 4 = 6\text{ms}^{-1}$$

← Practice test 4 unit 1



Correct



Unattempted



4/12

Q:

When a ball bounces back from floor such that sound and heat is produced then collision



Must be elastic



Must be inelastic



Momentum is conserved but K.E is not conserved



Both B and C

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Explanation

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Application of elastic collision

← Practice test 4 unit 1

Q:

A ball of mass 2 kg travelling at 8 ms^{-1} strikes a ball of mass 4 kg travelling at 2 ms^{-1} . Both balls are moving along the same straight line as shown



After collision, both balls move at the same velocity v . What is the magnitude of the velocity v ?

☒ 4 ms^{-1}

☐ 5 ms^{-1}

☐ 6 ms^{-1}

☐ 8 ms^{-1}

Explanation

← Practice test 4 unit 1



The spheres have a head on elastic collision.
Which statement is correct?

☐ The spheres stick together on impact



The total kinetic energy after impact is mv^2



The total kinetic energy before impact is zero



The total momentum before impact is $2mv$

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Explanation



Kinetic energy is conserved for elastic collision.

← Practice test 4 unit 1

what is the speed of the trucks after the collision?

☒ $\frac{v}{4}$

☐ $\frac{v}{2}$

☐ v

☐ $\frac{5v}{4}$

Explanation

This is a perfectly inelastic collision.



$$m(2v) + 3m(-v) = (m + 3m)v_f$$

$$-mv = 4mv_f$$

$$v_f = -\frac{1}{4}v$$

what is the speed of the trucks after the collision?

☒ $\frac{v}{4}$

☐ $\frac{v}{2}$

☐ v

☐ $\frac{5v}{4}$

Explanation

fectly inelastic collision.



1

← Practice test 4 unit 1

Total energy		Kinetic
Energy	Momentum	
Conserved	Conserved	Conserved

Total energy		Kinetic
Energy	Momentum	
Conserved	Conserved	Not
conserved		Conserved

Total energy		Kinetic
Energy	Momentum	
Conserved		
Conserved	Not conserved	

Total energy		Kinetic
Energy	Momentum	
Not conserved		Not
conserved	Conserved	

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Explanation

Total momentum and total energy remain conserved in all types pf collision.

← Practice test 4 unit 1



Incorrect



9/10

Q :

A ball is dropped from a height of 10 m. It is embedded 1 m in sand and stops. In this process



only momentum is conserved



only kinetic energy is conserved



both momentum and kinetic energy are conserved



neither momentum nor kinetic energy is conserved

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Explanation



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During inelastic collision only momentum is conserved

← Practice test 4 unit 1



Incorrect



10/10

Q :

When two bodies collide elastically then the quantity conserved is



Kinetic energy



Momentum



Both



None

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Explanation



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When bodies collide elastically both momentum and K.E remain conserved.

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QUIZZES

Practice test 5 unit # 1



2 min 21 sec



7 min

001

Start Quiz

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Q:

A cricket ball is hit at 45° to the horizontal with a kinetic energy K . The kinetic energy at the highest point is

0

$K/2$

$K/\sqrt{2}$

K

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2/10

Time



Send

Q:

A bomber drops a bomb, when it is vertically above the target. It misses the target because



Vertically component of the velocity of the bomber



Force of gravity



Acceleration of the bomber



Horizontal component of the velocity of the bomber

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Q/No

Time



Ans

Q :

A parabolic path for a projectile is shown in the figure. At which point acceleration is minimum?



B



A



C



Not possible

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Q:

A body is thrown horizontally from the top of a tower of height 5 m. It touches the ground at a distance of 10 m from the foot of the tower.

The initial velocity of the body is ($g = 10 \text{ ms}^{-2}$)

☐ 2.5 ms^{-1}

☐ 5 ms^{-1}

☐ 10 ms^{-1}

☒ 20 ms^{-1}

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4/10

Time



Link

Q:

A ball is thrown horizontally from the top of a tower. What happens to the horizontal component of its acceleration?



First increases and then decreases



Increase



Decrease



Zero



Q :

At maximum height in projectile motion the horizontal component of velocity will

- ☐ Maximum
- ☐ Zero
- ☐ Constant
- ☐ Both (b) and (c)

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Q : An aero plane is flying horizontally with a velocity of 10 m/s and at a height of 1960 m . When it is vertically above a point A on the ground, a bomb is released from it. The bomb strikes the ground at point B. The distance AB is (ignoring air resistance)

☐ 100 m

☐ 200 m

☐ 400 m

☐ 2 km

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Q:

A projectile is fired horizontally from a 490m high cliff with a velocity of 80ms^{-1} . The time taken by the projectile to reach the ground is

☐ 10 sec

☒ 7.5 sec

☐ 2.5 sec

☐ 5 sec

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Q : A man projects a coin upwards from the gate of a uniformly moving train. The path of coin for the man will be

- ☐ A Parabolic
- ☐ B Inclined straight line
- ☐ C Vertical straight line
- ☐ D Horizontal straight line

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Q:

For projectile motion in the absence of air resistance:

- ☐ A Vertical speed is constant
- ☐ B Horizontal force is constant
- ☐ C Horizontal acceleration is zero
- ☐ D Vertical acceleration is zero

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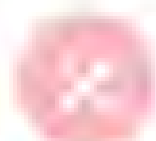
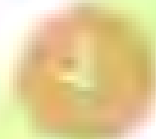
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QUIZ RESULT

Practice test 5 unit # 1



0/10

0.0%

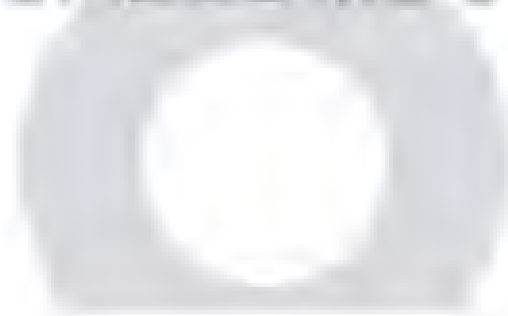
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Result Detail

SAEED MDCAT TEAM



SAEEDMDCAT



Q:

A cricket ball is hit at 45° to the horizontal with a kinetic energy K . The kinetic energy at the highest point is

0

$K/2$

$K/\sqrt{2}$

K

Explanation

Kinetic energy at highest point,

$$K_{\text{h}} = K \cos^2 45^\circ = \frac{K}{2}$$

← Practice test 5 unit # 1

Q:

A bomber drops a bomb, when it is vertically above the target. Its misses the target because

- ☐ Vertically component of the velocity of the bomber
- ☐ Force of gravity
- ☐ Acceleration of the bomber
- ☒ Horizontal component of the velocity of the bomber

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Explanation

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Due to air friction, horizontal velocity of bomb changes

← Practice test 5 unit # 1



Incorrect



3/10

Q :

A parabolic path for a projectile is shown in the figure. At which point acceleration is minimum?



B



A



C



Not possible

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Explanation



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For whole projectile trajectory
 $a = g$

← Practice test 5 unit # 1

Q:

A body is thrown horizontally from the top of a tower of height 5 m. It touches the ground at a distance of 10 m from the foot of the tower.

The initial velocity of the body is ($g = 10 \text{ ms}^{-2}$)

☐ 2.5 ms^{-1}

☐ 5 ms^{-1}

☒ 10 ms^{-1}

☐ 20 ms^{-1}

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Explanation

$$S = v \times \sqrt{\frac{2h}{g}} \Rightarrow 10 = v \times \sqrt{2 \times \frac{5}{10}} \Rightarrow v = 10$$

← Practice test 5 unit # 1

Q:

A ball is thrown horizontally from the top of a tower. What happens to the horizontal component of its acceleration?

- ☐ First increases and then decreases
- ☐ Increase
- ☐ Decrease
- ☒ Zero

Explanation

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For projectile motion: $F_x = 0$, $a_x = 0$

Q:
At maximum height in projectile motion the horizontal component of velocity will

☐ Maximum

☐ Zero

☒ Constant

☐ Both (b) and (c)

SAEED MDCAT TEAM

Explanation

SAEEDMDCAT

In projectile motion the horizontal component of velocity will remain constant

Q : An aero plane is flying horizontally with a velocity of 10 m/s and at a height of 1960 m. When it is vertically above a point A on the ground, a bomb is released from it. The bomb strikes the ground at point B. The distance AB is (ignoring air resistance)

100 m

200 m

400 m

2 km

Explanation

$$AB = R = v \sqrt{\frac{2H}{g}} = 10 \times \sqrt{\frac{2 \times 1960}{9.8}}$$

$$R = 10 \times 20 = 200 \text{ m}$$

Q :

A projectile is fired horizontally from a 490m high cliff with a velocity of 80ms^{-1} . The time taken by the projectile to reach the ground is

☒ 10 sec

☐ 7.5 sec

☐ 2.5 sec

☐ 5 sec

Explanation

$$y = \frac{1}{2}gt^2$$

$$t = \sqrt{\frac{2y}{g}} = \sqrt{\frac{2 \times 490}{9.8}} = 10 \text{ sec}$$

← Practice test 5 unit # 1



Correct



Unattempted



Incorrect



9/10

Q : A man projects a coin upwards from the gate of a uniformly moving train. The path of coin for the man will be



Parabolic



Inclined straight line



Vertical straight line



Horizontal straight line

Explanation

Because horizontal velocity is same for coin and the observer. So relative horizontal displacement will be zero.

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Correct



Unattempted



Correct



10%

Q :

For projectile motion in the absence of air resistance:



Vertical speed is constant



Horizontal force is constant



Horizontal acceleration is zero



Vertical acceleration is zero

Explanation

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$$F_x = ma_x = 0$$

$$a_x = 0$$

$$\overline{v_x} = \text{constant}$$

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QUIZZES

Practice test 6 unit # 1



2 min 21 sec



7 min

100%

Start Quiz

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Q : A body of mass 1 kg is thrown with a velocity of 10 ms^{-1} at an angle of 60° with the horizontal. Its momentum at the highest point is

☐ A 2 kg ms^{-1}

☐ B 3 kg ms^{-1}

☐ C 4 kg ms^{-1}

☐ D 5 kg ms^{-1}

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2/10

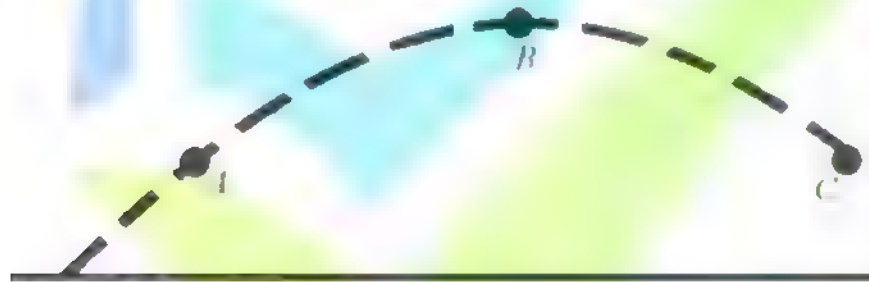
Time



10:00

Q:

A cannonball is fired and follows the parabolic path shown below. Air resistance is negligible. Point B is the highest point on the path and points A and C are at the same height.



How do the speeds of the cannonball at these points compare?



$v_A < v_B < v_C$



$v_C < v_B < v_A$



$v_B < v_A < v_C$



$v_B < v_A = v_C$





Q 116

Time



Unit

Q : A projectile is projected at angle of 30° with an initial velocity of 10 m/sec. It will go upto height of _____



10 m



2.5 m



1.25 m



0.75 m

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4/10

Time



10:00

Q : The angle of projection for which the maximum height and the horizontal range of a projectile are equal to



45°



$\tan^{-1}\left(\frac{1}{4}\right)$



$\tan^{-1}(4)$



None of these

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Q : If a projectile is thrown with 19.6 m/s velocity at 30° with x-axis, time taken to reach highest point?

☐ 1 sec

☐ 2 sec

☐ 3 sec

☐ 4 sec

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Q : A missile is fired for maximum range with a initial velocity of 20 m/s. If $g=10\text{m/s}^2$, the range of the missile is

☐ 30 m

☐ 20 m

☐ 40 m

☐ 60 m

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Q : If the initial speed of a projectile is doubled:

Its range will double

Its range will quadruple

Its range will be decreased by a factor of two

Its range will decrease by a factor of four

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Q : The path of projectile in presence of air friction is more likely to be

- ☐ A Parabolic
- ☐ B Circle
- ☐ C Elliptical
- ☐ D Straight line

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Q : In presence of air resistance, which one will be true for horizontal component of acceleration of projectile

☐ $a_x = 0$

☐ $a_x = g$

☐ $a_x \neq 0$

☐ $a_x = -F_x$

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Q :

If a projectile is projected with initial speed 20 msec⁻¹ at angle 75° with horizontal in presence of air friction, then which of the following may be the range of projectile

☐ 36 m

☐ 27 m

☐ 20 m

☐ 17 m

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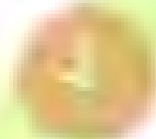
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QUIZ RESULT

Practice test 6 unit # 1



02-Feb-2021

0.00%



0/10

0.0%

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Result Detail

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← Practice test 6 unit # 1



Correct



Unattempted



Question



11/11

Q : A body of mass 1 kg is thrown with a velocity of 10 ms^{-1} at an angle of 60° with the horizontal. Its momentum at the highest point is



2 kg ms^{-1}



3 kg ms^{-1}



4 kg ms^{-1}



5 kg ms^{-1}

Explanation

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$$P = mv \cos \theta$$

$$= 1 \times 10 \times \cos 60^\circ = 10 \left(\frac{1}{2} \right) \text{ kg ms}^{-1}$$

$$= 5 \text{ kg ms}^{-1}$$

← Practice test 6 unit # 1



Correct



Unattempted



Incorrect



21,000

Q:

A cannonball is fired and follows the parabolic path shown below. Air resistance is negligible. Point B is the highest point on the path and points A and C are at the same height.



How do the speeds of the cannonball at the there points compare?



$v_A < v_B < v_C$



$v_C < v_B < v_A$



$v_B < v_A < v_C$



$v_B < v_A = v_C$

SAEED MDCAT TEAM



Correct



Unattempted



Incorrect



3/10

Q : A projectile is projected at angle of 30° with an initial velocity of 10 m/sec. It will go upto height of _____



10 m



2.5 m



1.25 m



0.75 m

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Explanation

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$$H = \frac{v_i^2 \sin^2 \theta}{2g} = \frac{10^2 \sin^2 \left(\frac{1}{2} \right)}{2 \cdot 10} = \frac{25}{20} = 1.25 \text{ m}$$

← Practice test 6 unit # 1



Correct



Unattempted



Incorrect



4/10

Q : The angle of projection for which the maximum height and the horizontal range of a projectile are equal to



45o



$\tan^{-1}\left(\frac{1}{4}\right)$



$\tan^{-1}(4)$



None of these

Explanation

$$H = \frac{R}{4} \tan \theta$$

$$\tan^{-1}(4) = \theta$$

SAEED MDCAT TEAM



Correct



Unattempted



Correct



5/10

Q : If a projectile is thrown with 19.6m/s velocity at 30° with x-axis, time taken to reach highest point?



1 sec



2 sec



3 sec



4 sec

Explanation

As the formula to reach maximum height is:

$$t = \frac{v_i \sin \theta}{g} = \frac{19.6 \times \sin 30}{9.8} = 1s$$

SAEED MDCAT TEAM



Correct



Unattempted



Incorrect



6/10

Q : A missile is fired for maximum range with a initial velocity of 20 m/s. If $g=10\text{m/s}^2$, the range of the missile is



30 m



20 m



40 m



60 m

Explanation

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$$R_{\max} = \frac{v_i^2}{g} = \frac{20 \times 20}{10} = 40\text{m}$$

← Practice test 6 unit # 1

Q : If the initial speed of a projectile is doubled:

☐ A Its range will double

☒ B Its range will quadruple

☐ C Its range will be decreased by a factor of two

☐ D Its range will decrease by a factor of four

Explanation

As $R \propto v_i^2$, so by doubling the initial velocity v_i Range will quadruple or increases 4 times.



Correct



Mathematically incorrect



Incorrect



8/10

Q : The path of projectile in presence of air friction is more likely to be



Parabolic



Circle



Elliptical



Straight line

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Correct



Unattempted



Correct



9/10

Q : In presence of air resistance, which one will be true for horizontal component of acceleration of projectile



$a_x = 0$



$a_x = g$



$a_x \neq 0$



$a_x = -F_x$

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Correct



Unattempted



Incorrect



10%

Q :

If a projectile is projected with initial speed 20 msec⁻¹ at angle 75° with horizontal in presence of air friction, then which of the following may be the range of projectile



36 m



27 m



20 m



17 m

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Abstract

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QUIZZES

Class Test-1 (Unit # 1)



ה'תשנ"ב

2. **100%**



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Q:

A train takes 1 hour to go from one station to the other. It travels at a speed of 30 kmh^{-1} for first half hour and at a speed of 50 kmh^{-1} for the next half hour. The average speed of the train is:

☐ 45 kmh^{-1}

☐ 35 kmh^{-1}

☐ 40 kmh^{-1}

☐ 30 kmh^{-1}

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2/30

25 min



25 min

Q:

A boat is sent across a river with a velocity of 8kmh^{-1} . If the resultant velocity of boat is 10kmh^{-1} , then the velocity of the river is



12.8kmh^{-1}



6kmh^{-1}



8kmh^{-1}



10kmh^{-1}

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Q: 11/11

25 min



Ans

Q:

Force of 5N acts on a body of 5kg for 5 sec then the rate of change in momentum is



25N



50N



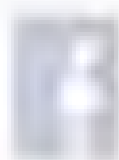
5N



125N

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Q : A cricket player catches a ball of mass 100 g and moving with a velocity of 25ms^{-1} . If the ball is caught 0.1s, the force of the ball exerted on the hand of the player is:



4N



40N



25N



250N

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5/20

25 min



10:01

Q :

A cricket ball of mass 0.5 kg strikes a bat normally with a velocity of 30 ms^{-1} and rebounds with a velocity of 20 ms^{-1} in the opposite direction. The impulse of the force exerted by the ball on the bat is



0.5 Ns



25 Ns



1.0 Ns



50 Ns

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1/20

25 min



10:00

Q : The rate of change of momentum of a body falling freely under gravity is equal to its



Impulse



Kinetic energy



Power



Weight

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7/30

25 min



25 min

Q : A particle of mass m moving with velocity v strikes a stationary particle of mass $2m$ and sticks to it. The speed of the system will be?



$$\frac{v}{2}$$



$$2v$$



$$\frac{v}{3}$$



$$3v$$

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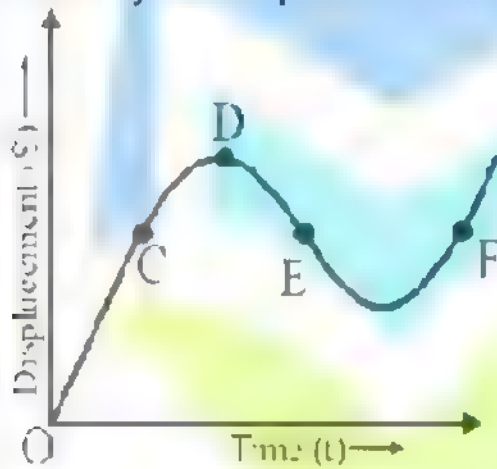
4/20

25 min



100%

Q : The displacement time graph for a moving particle is given below. The instantaneous velocity of the particle is negative at the point



D



F



C



E

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9/30

25 min



25 min

Q:

The displacement time graph of a particle moving with uniform velocity is



Parabola



Straight line



Circle



Hyperbola

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Q:

The displacement-time graphs of two particles A and B are straight lines making angles of 30° and 60° respectively with the time axis. If the velocity of A is v_A and that of B is v_B , the value of v_A/v_B is

☐ $1/2$

☐ $\frac{1}{\sqrt{3}}$

☐ $\sqrt{3}$

☒ $1/3$

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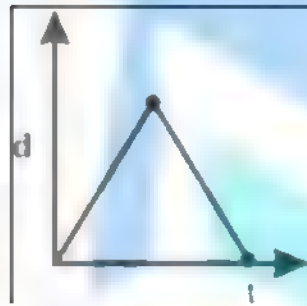
Q/38

25 min

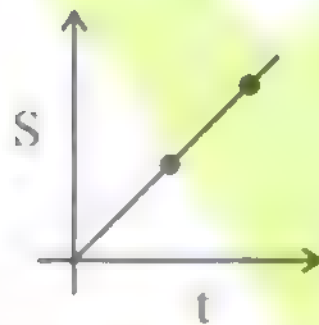


Q/38

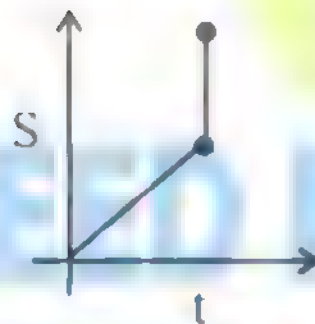
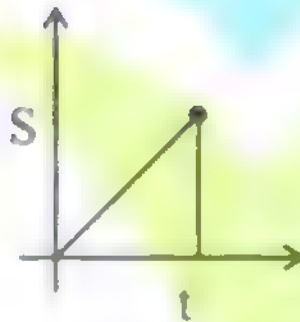
Q : To convert given displacement-time graph into distance time graph,



The corresponding distance time graph will be



The corresponding distance time graph will be





12/30

25 min



100%

Q : The slope of the tangent of a point on d-t graph gives the magnitude of



uniform velocity



Instantaneous velocity



average velocity



constant velocity

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Q/A

25 min



Q/A

Q :

If d-t curve is a straight line, it shows that body is



average velocity



uniform velocity



both '(a)' and '(b)'



instantaneous velocity

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MCQ

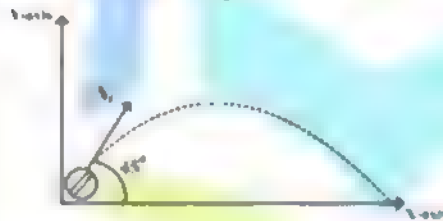
20 min



1000

Q:

A projectile is projected upwards with an angle of 45° with x-axis as shown in the figure such that its K.E at projection is 100J . What will be its K.E at the top?



0J



100J



25J



50J





Q130

25 min



Q131

Q:

At which point for a projectile its kinetic energy is completely converted into potential energy



At point of projection



At the highest point



Point to hit the ground



Not possible

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10/30

25 min



10/30

Q:

A 1000-kg airplane moves in straight flight at constant speed. The force of air friction is 1800 N. The net force on the plane is:



Zero



11800 N



1800 N



9800 N

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10/10

25 min



10/10

Q:

A projectile of mass m is thrown with a velocity v making an angle of 45° with the horizontal. The change in momentum from departure to arrival along vertical direction, is



$2mv$



$\sqrt{2}mv$



mv



$\frac{mv}{\sqrt{2}}$

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01:50

25 min



01:50

Q : A ball is projected horizontally from the top of a cliff on the surface of the earth with a speed of 40ms^{-1} . Assuming that there is no air resistance, what will its speed be 3 s later?



30ms^{-1}



40ms^{-1}



50ms^{-1}



60ms^{-1}

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41.50

21 min



41.50

Q:

A cannonball is fired and follows the parabolic path shown below. Air resistance is negligible. Point B is the highest point on the path and points A and C are at the same height



Which of the following best describes the direction of the velocity of the cannonball at point B?



to the right



down and to the right



up and to the right



up



A ball is fired and follows the parabolic path shown below. Air resistance is negligible. The ball starts at point A, reaches its highest point at B, and ends at point C. Points A and C are at the same height.



Compare the accelerations of the ball at the three points A, B, and C.



$a_A < a_B < a_C$



$a_B < a_A < a_C$



$a_A = a_B = a_C$



$a_A = a_B < a_C$





20/30

20 min



1 min

Q:

cannonball is fired and follows the parabolic path shown below. Air resistance is negligible. Point B is the highest point on the path and points A and C are at the same height.



How do the accelerations of the ball at the three points compare?



$a_A < a_B < a_C$



$a_B < a_A < a_C$



$a_A = a_B = a_C$



$a_A = a_B < a_C$





Q : Two balls projected at 30° and 60° with same initial velocities. The ratio of their maximum heights is:



1:2



1:4



1:3



$1:\sqrt{2}$

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22/30

25 min



unl

Q : A projectile is projected with kinetic energy (K.E). If it has the maximum possible horizontal range, then its kinetic energy at the highest point will be:



K.E



0.75 K.E



0.5 K.E



0.25 K.E

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24/10

25 min



4:01

Q : A body is thrown with a velocity of 9.8 m/s making an angle of 30° with the horizontal. It will hit the ground after a time



1 sec



2 sec



3 sec



1.5 sec

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24/12

21 min



1 min

Q:

Time of flight of projectile is



$$\frac{v_i \sin \theta}{g}$$



$$\frac{v_i^2 \sin \theta}{g}$$



$$\frac{2v_i \sin^2 \theta}{g}$$



$$\frac{2v_i \sin \theta}{g}$$

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25/10

25 min



25 min

Q : The maximum range of a projectile fired with some initial velocity is found to be 1000 m in the absence of wind and air resistance. The maximum height reached by the projectile is



250m



500 m



1000m



5000m

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24/10

25 min



25 min

Q :

At which pair of angles the range of projectile would be same



$30^\circ, 60^\circ$



$25^\circ, 65^\circ$



$15^\circ, 75^\circ$



all of these

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27/3/20

25 min



100%

Q : Four projectiles are fired with the same velocity at angle, 25° , 40° , 55° and 70° with the horizontal. The range of projectile will be largest for the one projected at angle



70°



40°



55°



25°

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24/10

25 min



24/10

Q:

Air resistance decreases the



horizontal component of velocity of a projectile



vertical component of velocity of a projectile



vertical component of acceleration of a projectile



none of these

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SAEEDMDCAT





Q :

When air resistance acts, acceleration during a fall will be

greater than g

less than g

equal to g

none of these

SAEED MDCAT

SAEED MDCAT TEAM

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25 min

25 min



25 min

Q : The Factors affecting the flight path of a Projectile from the following are



Air Resistance



Gravity.



Angle of Release



All of these

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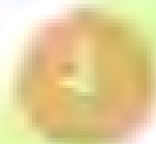


QUIZ RESULT

Class Test-1 (Unit # 1)



Q



Q



Q



Q



Q



Q

0/30

0.0%

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Result Detail

SAEED MDCAT TEAM



SAEEDMDCAT



← Class Test-1 (Unit # 1)

Q :

A train takes 1 hour to go from one station to the other. It travels at a speed of 30 kmh^{-1} for first half hour and at a speed of 50 kmh^{-1} for the next half hour. The average speed of the train is:

☐ 45 kmh^{-1}

☐ 35 kmh^{-1}

☒ 40 kmh^{-1}

☐ 30 kmh^{-1}

Explanation

As it is the equal time partition case so

$$V_{av} = \frac{v_1 + v_2}{2} = \frac{30 + 50}{2} = \frac{80}{2} = 40 \text{ kmh}^{-1}$$

← Class Test-1 (Unit # 1)

Q:

A boat is sent across a river with a velocity of 8kmh^{-1} . If the resultant velocity of boat is 10kmh^{-1} , then the velocity of the river is

☐ 12.8kmh^{-1}

☒ 6kmh^{-1}

☐ 8kmh^{-1}

☐ 10kmh^{-1}

Explanation

$$v_r = \sqrt{v_R^2 - v_B^2} = \sqrt{10^2 - 8^2} = 6 \text{ kmh}^{-1}$$

← Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



Question

Q:

Force of 5N acts on a body of 5kg for 5 sec then the rate of change in momentum is



25N



50N



5N



125N

Explanation

$$\frac{\Delta p}{\Delta t} = F$$
$$\frac{\Delta p}{\Delta t} = 5N$$

← Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



4/5

Q : A cricket player catches a ball of mass 100 g and moving with a velocity of 25ms^{-1} . If the ball is caught 0.1s, the force of the ball exerted on the hand of the player is:



4N



40N



25N



250N

Explanation

$$F = \frac{mv}{t} = \frac{(0.1)(25)}{0.1} = 25\text{N}$$

← Class Test-1 (Unit # 1)



Correct



Unattempted



Question



Answer

Q :

A cricket ball of mass 0.5 kg strikes a bat normally with a velocity of 30 ms⁻¹ and rebounds with a velocity of 20 ms⁻¹ in the opposite direction. The impulse of the force exerted by the ball on the bat is



0.5 Ns



25 Ns



1.0 Ns



50 Ns

Explanation

Impulse=change in momentum

$$I = m\vec{u} - m(-v)$$

$$= m(u + v) = 0.5 \times (30 + 20) = 25 \text{ Ns}$$

← Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



6/50

Q : The rate of change of momentum of a body falling freely under gravity is equal to its



Impulse



Kinetic energy



Power



Weight

Explanation

$$F = \frac{\Delta p}{\Delta t} = w = mg$$

← Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



Attempted

Q : A particle of mass m moving with velocity v strikes a stationary particle of mass $2m$ and sticks to it. The speed of the system will be?



$\frac{v}{2}$



$2v$



$\frac{v}{3}$



$3v$

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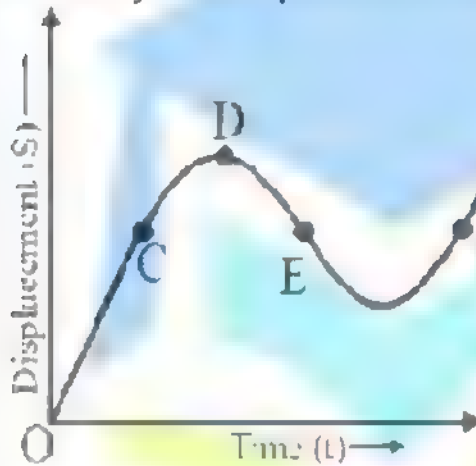
Explanation:

$$mv + 0 = (m + 2m)v$$

$$v = \frac{mv}{3m} = \frac{v}{3}$$

← Class Test-1 (Unit # 1)

Q : The displacement time graph for a moving particle is given below. The instantaneous velocity of the particle is negative at the point



☐ D

☐ F

☐ C

☒ E

Explanation

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At point E, the slope is decreasing negatively

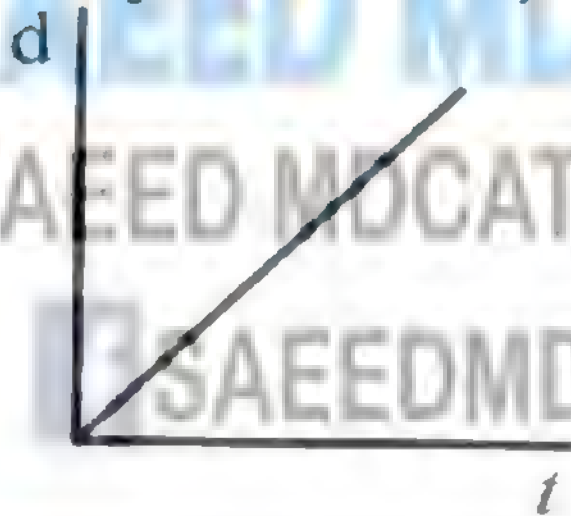
← Class Test-1 (Unit # 1)

The displacement-time graph of a particle moving with uniform velocity is

- ☐ Parabola
- ☒ Straight line
- ☐ Circle
- ☐ Hyperbola

Explanation

$\vec{d}-t$ graph represents that particle is moving with uniform velocity



← Class Test-1 (Unit # 1)



Incorrect



10/30

Q:

The displacement-time graphs of two particles A and B are straight lines making angles of 30° and 60° respectively with the time axis. If the velocity of A is v_A and that of B is v_B , the value of v_A/v_B is



1/2



$\frac{1}{\sqrt{3}}$



$\sqrt{3}$



1/3

Explanation

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$$v_A = \tan 30^\circ \text{ and } v_B = \tan 60^\circ \therefore \frac{v_A}{v_B} = \frac{t}{t}$$

← Class Test-1 (Unit # 1)



Incorrect



10/30

Q:

The displacement-time graphs of two particles A and B are straight lines making angles of 30° and 60° respectively with the time axis. If the velocity of A is v_A and that of B is v_B , the value of v_A/v_B is



1/2



$\frac{1}{\sqrt{3}}$



$\sqrt{3}$



1/3

Explanation

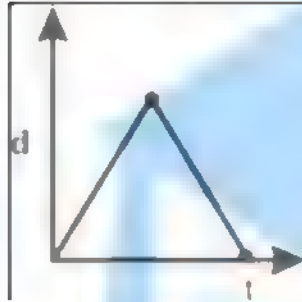
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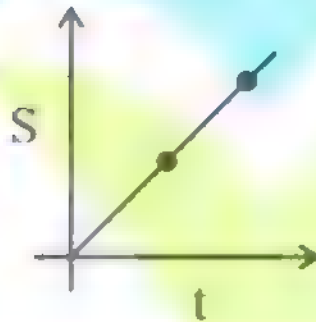
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$$\tan 60^\circ \therefore \frac{v_A}{v_B} = \frac{\tan 30^\circ}{\tan 60^\circ} = \frac{1/\sqrt{3}}{\sqrt{3}} = \frac{1}{3}$$

Q : To convert given displacement-time graph into distance time graph,



The corresponding distance time graph will be



Q : The slope of the tangent of a point on d-t

graph gives the magnitude of

Q : The slope of the tangent of a point on d-t graph gives the magnitude of

uniform velocity

Instantaneous velocity

average velocity

constant velocity

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Overall (passed) 11/13 (83.33%)



Correct



Not Attempted



Incorrect



13/14

Q :

If d-t curve is a straight line, it shows that body is



average velocity



uniform velocity



both '(a)' and '(b)'



instantaneous velocity

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0J

100J

25J

50J

Explanation

$$K.E = K.E_1 \cos^2 \theta$$

$$= K.E_{\text{max}} \left[\frac{1}{\sqrt{2}} \right]^2$$

$$= 100 \times \frac{1}{2}$$

$$= 50J$$

← Class Test-1 (Unit # 1)



Incorrect



15/30

Q :

At which point for a projectile its kinetic energy is completely converted into potential energy



At point of projection



At the highest point



Point to hit the ground



Not possible

Explanation

There is no point in the path of a projectile where K.E is completely converted to P.E every point have some amount of K.E and P.E.

← Class Test-1 (Unit # 1)

Q:

A 1000-kg airplane moves in straight flight at constant speed. The force of air friction is 1800 N. The net force on the plane is:

- ☒ Zero
- ☐ 11800 N
- ☐ 1800 N
- ☐ 9800 N

Explanation

$$v = \text{constant} \Rightarrow \Delta v = 0$$

$$a_{\text{net}} = 0 \Rightarrow F_{\text{net}} = 0$$

$$v = \text{constant} \Rightarrow \Delta v = 0$$

$$a_{\text{net}} = 0 \Rightarrow F_{\text{net}} = 0$$

← Class Test-1 (Unit # 1)

horizontal. The change in momentum from departure to arrival along vertical direction, is

☐ $2mv$

☒ $\sqrt{2} mv$

☐ mv

☐ $\frac{mv}{\sqrt{2}}$

Explanation

Change in momentum is the product of force and time

$$\begin{aligned}\Delta p &= mg \cdot \frac{2s \sin \theta}{g} \\ &= 2m \sin \theta \\ &= 2mv \sin 45^\circ = \frac{2mv}{\sqrt{2}} = \sqrt{2} mv\end{aligned}$$

← Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



18/20

Q : A ball is projected horizontally from the top of a cliff on the surface of the earth with a speed of 40ms^{-1} . Assuming that there is no air resistance, what will its speed be 3 s later?



30ms⁻¹



40ms⁻¹



50ms⁻¹



60ms⁻¹

Explanation

$$v = \sqrt{v_x^2 + g^2 t^2} = \sqrt{(40)^2 + (10)^2 (3)^2}$$

$$v = \sqrt{1600 + 900} = \sqrt{2500} = 50\text{ms}^{-1}$$

← Class Test-1 (Unit # 1)

points A and C are at the same height



Which of the following best describes the direction of the velocity of the cannonball at point B?

- ☒ to the right
- ☐ down and to the right
- ☐ up and to the right
- ☐ up

Explanation

at highest point only horizontal velocity acts which having direction horizontally towards right according to given diagram

← Class Test-1 (Unit # 1)

cannonball is fired and follows the parabolic path shown below. Air resistance is negligible. Point B is the highest point on the path and points A and C are at the same height.



How do the accelerations of the ball at the three points compare?

☐ $a_A < a_B < a_C$

☐ $a_B < a_A < a_C$

☒ $a_A = a_B = a_C$

☐ $a_A = a_B < a_C$

Explanation

ay in projectile motion at every point is equal to g which has direction directed towards downward.

← Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



21/40

Q : Two balls projected at 30° and 60° with same initial velocities. The ratio of their maximum heights is:



1:2



1:4



1:3



$1:\sqrt{2}$

Explanation

As

$$H_{\max} = \frac{v_i^2 \sin^2 \theta}{2g}, \text{ As } v_i \text{ is same so } \frac{H_1}{H_2} = \frac{\sin^2 \theta_1}{\sin^2 \theta_2}$$

← Class Test-1 (Unit # 1)



Correct



Unattempted



Correct



21/40

Q : Two balls projected at 30° and 60° with same initial velocities. The ratio of their maximum heights is:



1:2



1:4



1:3



$1:\sqrt{2}$

Explanation

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As v_i is same so $\frac{H_1}{H_2} = \frac{\sin^2 \theta_1}{\sin^2 \theta_2} = \frac{(\sin 30)^\circ}{(\sin 60)^\circ} = 1:3$

← Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



2/2 (100%)

Q : A projectile is projected with kinetic energy (K.E). If it has the maximum possible horizontal range, then its kinetic energy at the highest point will be:



K.E



0.75 K.E



0.5 K.E



0.25 K.E

Explanation

$$K.E_H = K.E_1 \cos^2 \theta$$

$$K.E_H = K.E_1 \cos^2 45^\circ = 0.5 K.E$$

← Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



25/100

Q : A body is thrown with a velocity of 9.8 m/s making an angle of 30° with the horizontal. It will hit the ground after a time



1 sec



2 sec



3 sec



1.5 sec

Explanation

$$t = \frac{2v_i^2 \sin \theta}{g} = \frac{2(9.8) \sin 30}{(9.8)} = 1 \text{ sec}$$

Q:
Time of flight of projectile is

☐ $\frac{v_i \sin \theta}{g}$

☐ $\frac{v_i^2 \sin \theta}{g}$

☐ $\frac{2v_i \sin^2 \theta}{g}$

☒ $\frac{2v_i \sin \theta}{g}$

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Explanation

$\frac{2v_i \sin \theta}{g}$

is the time of flight of projectile.

← Class Test-1 (Unit # 1)



Correct



Unattempted



Wrong



Selected

Q : The maximum range of a projectile fired with some initial velocity is found to be 1000 m in the absence of wind and air resistance. The maximum height reached by the projectile is



250m



500 m



1000m



5000m

Explanation

$$R \tan \theta = 4H$$

$$\theta = 45^\circ$$

$$H = \frac{R}{4} = \frac{1000}{4} = 250m$$

← Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



26, 30

Q:

At which pair of angles the range of projectile would be same



$30^\circ, 60^\circ$



$25^\circ, 65^\circ$



$15^\circ, 75^\circ$



all of these

Explanation

$$\theta_1 + \theta_2 = 90^\circ$$

$$R\theta_1 = R\theta_2$$

← Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



2/1/20

Q : Four projectiles are fired with the same velocity at angle, 25° , 40° , 55° and 70° with the horizontal. The range of projectile will be largest for the one projected at angle



70°



40°



55°



25°

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Explanation



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Range will be maximum at that angle which is nearest to 45°



Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



28/30

Q :
Air resistance decreases the



horizontal component of velocity of
a projectile



vertical component of velocity of
a projectile



vertical component of acceleration of
a projectile



none of these

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24

25

26

27

28

29

30



Class Test-1 (Unit # 1)



Incorrect



29/30

Q :

When air resistance acts, acceleration during a fall will be

A

greater than g

B

less than g

C

equal to g

D

none of these

Explanation

acceleration during a fall will be less than g because air resistance affects the motion of the falling objects by slowing it down

24

25

26

27

28

29

30



Class Test-1 (Unit # 1)



Correct



Unattempted



Incorrect



30/30

Q : The Factors affecting the flight path of a Projectile from the following are



Air Resistance



Gravity.



Angle of Release



All of these

Explanation

all factors given are responsible for the flight of projectile

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